

## **SECTION 105 CONTROL OF WORK**

**105.01 AUTHORITY OF THE ENGINEER.** The Engineer will decide all questions regarding the quality and acceptability of materials furnished, work performed, the rate of progress of the work, the interpretation of the Contract; and the acceptable fulfillment of the Contract.

- A. The Engineer will suspend the work wholly or in part for failure to:
  - 1. Correct conditions unsafe for project personnel or the public; or
  - 2. Carry out provisions of the Contract; or
  - 3. Carry out orders of the Engineer.
- B. Work may also be partially or wholly suspended for:
  - 1. Periods necessary due to unsuitable weather; or
  - 2. Conditions unsuitable for the prosecution of the work; or
  - 3. Any condition or reason determined to be in the Department's interest.

**105.02 PLANS AND WORKING DRAWINGS.** The plans show the details of structures, lines, grades, typical roadway cross sections, location and design of structures, and a summary of items appearing in the bid package.

Supplement the plans with Contractor prepared working drawings to adequately control the work. Provide detail working drawings for structures to control the work that are not included in the department furnished plans. Working drawings include stress sheets, shop drawings, erection plans, falsework plans, cofferdam plans, bending diagrams for reinforcing steel, computations, or other supplementary plans or similar data required of the Contractor. Check and approve working drawings before submittal to the Project Manager. The Contractor's approval must be shown on the drawings.

Assure working drawings, falsework plans, and calculations for facilities open to public travel are signed by a professional engineer before submittal to the Project Manager.

### **105.03 CONFORMITY WITH PLANS AND SPECIFICATIONS.**

**105.03.1 General.** Perform work and furnish materials to meet the Contract requirements.

Provide materials and workmanship uniform in character and meeting the plan dimensions and contract specifications.

When a contract item does not meet the contract requirements but is adequate to serve the design purpose, the Engineer will determine the extent the work will be accepted and remain in place. The Engineer will document the basis of acceptance by change order, providing an adjustment in the contract unit price.

When a contract item does not meet the Contract requirements resulting in work inadequate to serve the design purpose, remove and replace or correct the work by and at Contractor expense.

**105.03.2 Items Designated for Acceptance on A Lot Basis.** Contract items listed in Table 105-1 are designated for acceptance on a lot-by-lot basis. The elements in the table will be evaluated and the contract items accepted under this provision. All

other contract items will be evaluated for acceptance under the applicable specifications covering those items.

An element of a lot will be evaluated for conformance when results of one or more tests are outside specified tolerance limits for that element.

All the individual test results in the lot for the element to be evaluated will be averaged, and the percent of price reduction for the lot determined by the applicable formula.

1. The formula  $P = (Xn + aR - Tu) \times F$  will be used if a maximum limit only is specified; or when the average of the test values is above the midpoint of a specified band or above a job mix target value.
2. The formula  $P = (TL + aR - Xn) \times F$  will be used if a minimum limit only is specified; or when the average of the several test values is below the midpoint of a specified band or below a job mix target value.

**TABLE 105-1  
CONTRACT ITEMS - EVALUATION ELEMENTS**

ELEMENTS EVALUATED						
ITEM	Aggregate Gradation	Fineness Modulus	Penetration	Compaction	Cleanliness Value	Fracture
Selected Surf	X					
Sand Surf	X					
Cr Base Crse Type A	X					X
Cr Base Crse Type B	X					
Cr Top Surf Type A	X					X
Cr Top Surf Type B	X					
Cr Agg - Cover Mat.	X				X	X
Portland Cement-Treated Base	X					
PM Surf and Base	X			X		X
OGFC	X					X
AC used in PM Surf, Base and OGFC			X			
PCCP	X	X				

Where:

**P** is the percent of reduction in contract price.

**Xn** is the average of the several test values from samples taken from the lot, with **n** indicating the number of values.

- a** is a variable factor to be used as **n** changes according to the following: when **n** is 3, **a** = 0.45; **n** is 4, **a** = 0.38; **n** is 5, **a** = 0.33; **n** is 6, **a** = 0.30; and **n** is 7, **a** = 0.28.
- R** is the difference between the highest and lowest values in the group of several test results from the lot.
- Tu** is the upper or maximum tolerance limit permitted by the specifications.
- TL** is the lower or minimum tolerance limit permitted by the specifications.
- F** is the price reduction factor to be applied for each element as shown in Table 105-2.

**TABLE 105-2  
TABLE OF PRICE REDUCTION FACTORS**

ELEMENT	FACTOR "F"
100% size sieve	1
½-inch (12.5 mm) sieve and larger	1
No. 100 (0.150 mm) sieve to 3/8-inch (9.5 mm) sieve inclusive (except 100% size sieve)	Cover Material, 2 All Other Aggregates, 3
No. 200 (0.075 mm) sieve	Cover Material, 3 All Other Aggregates, 7
Fine aggregate fineness modulus	12
O.G.F.C. No. 4 (4.75 mm) sieve	4
O.G.F.C. No. 8 (2.35 mm) sieve	5
O.G.F.C. No. 200 (0.075 mm) sieve	6
Penetration 85-100 Asphalt Cement	3
Penetration 120-150 Asphalt Cement	2
Penetration 200-300 Asphalt Cement	1
Compaction	12
Fracture	2

If **P** is less than 3 or a negative quantity, the lot will be accepted as being in conformance. If one or more elements for a contract item show a positive **P** value, the positive values will be added and the resulting sum used to determine whether the lot is in conformance. If the total **P** value is between 3 and 25, the Engineer may require correction or accept the lot at a reduced price. If **P** is greater than 25, the Engineer may: (1) require complete removal and replacement with specification material at Contractor expense; (2) require corrective action to bring the material into conformance at Contractor expense; or, (3) where the finished product is found to be capable of initially performing the intended purpose but with a reduced service

life expectancy, permit leaving the material in place with an appropriate price adjustment calculated using a **P** value ranging between 25 and 50.

Immediately halt production following written notification when either of the following has occurred:

1. Three consecutive lots for a contract item have an individual total **P** value of 5 or more;
2. Beginning with the second lot, when three tests within one lot have one or more elements outside the specification bands and the total **P** value for the lot is 5 or more.

Make adjustments to bring the product within the specification limits before resuming production. The Contractor does not have the option of accepting a price reduction in lieu of producing specification material. Continued production of non-specification material is prohibited. Material that is obviously defective may be isolated and rejected without regard to sampling sequence or location within a lot.

**105.03.3 Quality Incentive Allowance.** A pay factor of 1.05 will be applied to the plant mix surfacing lots where the results of aggregate gradation tests for the No. 4, No. 40, and No. 200 sieves are not more than one-half the allowable tolerance from the job mix target value. A pay factor of 1.05 will be applied to the lots of plant mix surfacing where the average density for the lot (**X<sub>n</sub>**) is from 97 percent to 98 percent, inclusive, of the target field Marshall density and the range (**R**) is three or less.

Quality incentive allowances will be used to offset any price reductions on progress estimates. Any quality incentive allowance remaining after all price reductions have been deducted will be paid as a lump sum when all work on the item is complete.

**105.04 COORDINATION OF CONTRACT PROVISIONS.** All documents referred to in Subsection 101.19 are essential parts of the Contract, and a requirement occurring in one is binding as though occurring in all. They are complementary and describe and provide for a complete contract. If a discrepancy exists, the governing ranking will be:

**Dimensions**

1. Plan
2. Calculated
3. Scaled

**Information**

1. Special Provisions
2. Plans
3. Supplemental Specifications
4. Standard Specifications
5. Detailed Drawings

**105.05 COOPERATION BY CONTRACTOR.** The Engineer will supply a minimum of 15 sets of contract documents. Keep at least one set available on the project at all times.

Give the work the constant attention necessary to facilitate progress and cooperate with the Engineer, Project Manager, the inspectors, and other contractors.

Maintain a competent Superintendent capable of reading and understanding the Contract documents who is experienced in the work being performed at all times.

Provide the Project Manager in writing the Superintendent's name assigned to the project, before work starts.

The Superintendent will receive instructions from the Project Manager or authorized representatives. The Superintendent shall have authority to execute written orders or directions of the Project Manager without delay and promptly supply the resources to complete the Contract.

**105.06 COOPERATION WITH UTILITIES.** The Department will require utility companies, pipeline owners, and other utility agencies to adjust the utility fixtures, pipelines, and other appurtenances within or adjacent to the construction limits.

Cooperate with utility owners in the removal and rearrangement of utility facilities to minimize interruption to utility service and duplication of work by the utility owner.

All utility facilities within the construction limits will be relocated or adjusted by the owners.

Submission of a bid is an affirmative statement that the Contractor has considered in the bid proposal all permanent and temporary utility facilities in the present or relocated positions as specified in the Contract and as revealed by its site investigation. No additional compensation is allowed for delays, inconvenience, or damage sustained due to interference from the utility facilities or the moving operations.

The Contract indicates utility items to be relocated or adjusted and who is to perform the work. The Contract indicates the means of adjudication, if any, if the utility owners fail to relocate or adjust the facilities.

**105.07 COOPERATION BETWEEN CONTRACTORS.** The Department reserves the right to contract for and perform other or additional work on or near the work for the project.

Conduct the work without interfering with or hindering the progress or completion of the work by other contractors. Cooperate with other contractors working within the limits of the project.

Each contractor involved shall accept all liability, financial or otherwise, in connection with the Contract and protect and save harmless the Department from damages or claims that may arise because of inconvenience, delay, or loss experienced because of the presence and operations of other contractors working within the limits of the same project.

Coordinate and sequence with the work of other contractors. Do not store materials, tools, machinery, and other equipment in locations that interfere with the work of other contractors.

#### **105.08 CONSTRUCTION STAKES, LINES, AND GRADES.**

**105.08.1 Bluetop Staking.** The Department will set construction stakes establishing lines, slopes, and profile grade for road work, excluding finish grade stakes (bluetops). The Department will set centerline and bench marks for culverts, protective and accessory structures and appurtenances as determined necessary. The Project Manager will furnish all necessary information relating to lines, slopes, and grades. Use these stakes and marks as the field control to perform the work.

Set the finish grade stakes (bluetops) using a Montana registered Land Surveyor. Hire survey personnel that are trained, experienced, and skilled in construction layout and staking. Do not hire a Department employee to perform the bluetop staking.

A. Perform the following using copies of the Department's bench level and transit notes:

1. Re-establish roadway centerline;
2. Calculate the bluetop grades for subgrade and each base course from the plan information. Consult the Project Manager regarding establishing bluetop grades for curve runoffs and ramps;
3. Set a bluetop line at centerline and each shoulder to establish the correct grade elevations at the subgrade and the top of each full course of each grade of base gravel. Do not exceed 20 feet (6 m) between adjacent lines in any case. Additional bluetop lines are required for additional passing or climbing lanes, and slope or crown breaks between shoulders. Set all rough grade stakes required to control the work. On typical sections using special borrow, the top of the special borrow is considered the subgrade for the purpose of bluetopping;
4. Set bluetop lines for safety shoulders, median and shoulder ditches at 100 foot (30.5 m) intervals.

Furnish the number of bluetop stake lines meeting the Department Survey Manual requirements and standard engineering practice to produce the typical sections and finish surface quality required by specification. Set subgrade bluetops at maximum 100 foot (30.5 m) intervals for tangent sections and 50 foot (15 m) intervals for curves. Set bluetop staking intervals for base gravel at maximum 50 foot (15 m) intervals for tangents and curves. Reduce the above intervals as required for extreme curvature and grade changes on ramps and frontage roads.

Drive each stake top to within 0.05 feet (15 mm) of the required elevation.

Furnish all stakes for bluetop staking. The stakes must be wedged shaped measuring 1½ X 1½ X 10-inches (38 X 38 X 250 mm) minimum.

Run a level circuit to check the project bench marks on each roadway section being staked.

Keep field survey notes in a standard field notebook, written in a clear, orderly, neat manner meeting the Department Survey Manual requirements and standard engineering practice. Use Department furnished field notebook paper. The Project Manager will randomly inspect the notes for acceptance. The finished notes become the Department's property.

Finish the work to meet the contract requirements. Correct all deficient work caused by incorrect staking and reset all bluetop stakes lost or destroyed by traffic or construction at Contractor expense.

**105.08.2 Bridge Survey.** The Department will establish control points defining median or roadway centerline, bridge centerline, and benchmarks for elevation control.

Establish and maintain all other survey controls required to control bridge alignment and grade meeting the plan dimensions and elevations using a Montana registered land surveyor. Use survey personnel trained, experienced, and skilled in construction layout and staking. Do not hire Department personnel to perform survey work. Use Department furnished field note book paper. Furnish all stakes, steel pins, lath, and other materials required to establish and maintain the survey control points.

Furnish horizontal and vertical control meeting the Department's Survey Manual requirements. Furnish the Project Manager the original survey notes upon request. Furnish the Project Manager copies of the notes showing the initial layout and primary controls and references and the method of independent check before starting work on the substructure units. Submit to the Project Manager a copy of the structure excavation cross section notes 24 hours before starting excavation. The Project Manager reserves the right to re-survey any pay item area.

Make calculations from the plan information to control alignment and elevation. Correct all mis-locations, mis-alignments, and incorrect elevations caused by Contractor calculations, layouts, and surveys at Contractor expense. Submit the proposed method of correction to the Project Manager for approval. Do not begin the corrective work until the proposal has been reviewed and approved.

#### **105.08.3 METHOD OF MEASUREMENT.**

- A. Bluetop Staking.** Road construction staking is measured by the course mile (kilometer) along the roadway centerline to the nearest 0.1 mile (10 m). A course mile (course kilometer) is one mile (one kilometer) for each two-lane roadway including shoulders and ditches. Each traffic lane is considered as one-half course mile (one-half course kilometer) including the adjacent shoulder, ditch, parking, turning, median lanes, and chain up areas.

The subgrade and each gravel course requiring bluetop staking are measured separately by the course mile (course kilometer) for each roadway section, each ramp, each intersecting roadway, each PTW connection and temporary detour, and each frontage road.

- B. Bridge Survey.** Bridge survey is a lump sum item.

**105.08.4 Basis of Payment.** Payment for the completed and accepted quantities is made as follows:

<u>Pay Item</u>	<u>Pay unit</u>
Bluetop Staking	Course Mile (kilometer)
Bridge Survey	Lump Sum

Payment at the contract unit price is full compensation for all resources necessary to complete the item of work under the Contract.

**105.09 AUTHORITY AND DUTIES OF PROJECT MANAGER.** Each project will be staffed with a Project Manager who is the Engineer's direct representative. The Project Manager has immediate charge of the engineering details of each construction project and is responsible for the administration and satisfactory completion of the project.

The Project Manger can :

1. Reject defective material;
2. Suspend work being improperly performed;
3. Execute any authority delegated to the Project Manager by the Engineer.

The Project Manager will be identified before work begins.

**105.10 AUTHORITY AND DUTIES OF INSPECTORS.**

Department inspectors are authorized to:

- A. Inspect all work being done and materials furnished. Inspection extends to all or any part of the work and to the preparation or manufacture of the materials to be used. Inspection does not relieve the Contractor's obligation to perform the work as specified in the Contract.
- B. Reject materials or suspend the work until the issue can be referred to and decided by the Project Manager.

Inspectors cannot :

1. Revoke, alter, enlarge, or relax any requirements of the Contract;
2. Final approve or accept any portion of work;
3. Issue instructions contrary to the Contract.

If the Contractor believes it has been given instructions contrary to the Contract by an Inspector, immediately advise the Project Manager in writing to seek clarification. The Inspector or Project Manager will not act as superintendent for the Contractor or interfere with the Contractor's management of the work.

**105.11 INSPECTION OF WORK.** All work is subject to Department inspection. Allow the Inspector access to all parts of the work and furnish information and assistance necessary to make a complete and detailed inspection. Provide a safe environment for the inspector during the inspections.

Remove or uncover portions of the finished work as directed. Once examined, restore the work to the contract requirements. If the work is acceptable, the uncovering, or removing and replacing the covering or making good the parts removed will be paid for as extra work. If the work is unacceptable, the uncovering, removing, and replacing the covering or making good the parts removed is at Contractor expense.

Work done or materials used without inspection by an authorized Department inspector may be ordered removed and replaced at Contractor expense.

When a government agency, political subdivision, a utility or railroad is to accept or pay a portion of the cost of the work covered by the Contract, the organization's representatives may inspect the work. The inspection does not make that entity a party to the Contract and shall not interfere with the rights of either party to the Contract.

**105.12 REMOVAL OF UNACCEPTABLE AND UNAUTHORIZED WORK.** Work not meeting the Contract requirements is unacceptable, unless determined acceptable under Subsection 105.03.

Remove and replace any unacceptable work before final acceptance at Contractor expense. This requirement has full effect regardless of the fact that the unacceptable work or defective materials were known or overlooked by the inspector.

Work done contrary to instructions received, or beyond the plan limits, or extra work done without the permission of the Project Manager will not be considered for payment. Work so done may be ordered removed, restored or replaced at Contractor expense.

Neither the Contractor nor the Department shall incur any liability by reason of any verbal directions or instructions received from the Project Manager. The Department will not be liable for extra materials furnished or used, or for extra work or labor done, unless required by written order from the Project Manager.

If the Contractor fails to follow any order made under this Subsection, the Project Manager has the authority to remove, replace, or restore the work and deduct the costs from any monies due or to become due the Contractor.

**105.13 VACANT.**

**105.14 VACANT.**

**105.15 ACCEPTANCE.**

**105.15.1 Partial Acceptance.** When a unit or portion of the project, such as a structure, an interchange, a group of signs or delineators, or a section of road or pavement is substantially complete, a final inspection of that unit may be requested. If the Engineer finds that the unit has been completed to the Contract requirements, the unit may be accepted as complete and the Contractor may be relieved of further maintenance for that unit. Partial acceptance does not void or alter any of the Contract terms. The Engineer does not have to accept a portion of the project before final acceptance.

**105.15.2 Final Acceptance.** Upon notice of completion of the entire project, the Engineer will arrange to make a final inspection. Where all work is complete but deferment of final inspection is necessary for causes outside the Contractor's control, the Engineer will issue a suspend work order and time charges will cease. If the Contract is found satisfactorily completed, the inspection will constitute the final inspection. The Engineer will issue a Certificate of Completion that the work was completed as of the date of the final inspection.

If the inspection discloses unsatisfactory work, the Engineer will issue instructions on the necessary corrections. Immediately comply with the instructions. When the deficiencies are corrected, another inspection will be made, which constitutes the final inspection.

**105.16 CLAIMS FOR ADJUSTMENT AND DISPUTES.**

**105.16.1 Notice of Potential Claim.** Inform the Project Manager immediately upon discovery of a potential problem, disagreement or dispute that could result in a request for additional compensation, time extension or contract change, whether arising under the Contract, its performance, or for any other reason.

Submit a written request detailing why additional compensation, time extension or contract change is warranted. The Project Manager will issue a written response within 3 working days of receipt of the request. Should the Contractor disagree with the written decision, instruction, or action, submit within 3 working days of receipt of the written response a fully completed Notice of Potential Claim Form, available from the Project Manager.

Specify in the Notice of Potential Claim all objections to the Project Manager's response and the basis for and amount of any additional compensation, extension of time or contract change.

Immediately begin to keep and maintain complete, accurate, and specific daily records of the potential claim details, starting at the time the Notice is filed. Use the Department's Cost Record of Potential Claim Form available from the Project Manager. Base equipment costs on the Contractor's internal rates for ownership, depreciation, and operating expense.

Allow the Project Manager access to and provide copies of all records when requested.

Make other records available for technical and audit evaluation after the work has been performed.

The Contractor waives all claims for additional compensation, time extension or Contract change by:

- A. Failing to timely file a Notice of Potential Claim;
- B. Failing to timely file a formal claim;
- C. Failing to keep timely and complete detailed daily records; or
- D. Failing to submit claims updates as are required.

**105.16.2 Submission of Claims.** Submit the claim in writing to the Project Manager within 30 calendar days following submission of a Notice of Potential Claim. Specify all reasons for each requested item of additional compensation, time extension, or Contract change, referenced to the applicable provisions of the Contract. Submit verified claim cost records on forms provided, and any additional information pertinent to the claim.

Promptly furnish in writing any clarification or additional information or data requested by the Engineer.

Submit claim updates every 30 calendar days until all costs have been incurred, or the Department approves the claim.

**105.16.3 Decision on Claims.** The District Engineer will provide a written decision on the claim within 30 calendar days of receipt of the formal claim. Appeal of the Engineer's decision must be made in writing to the Board of Contract Appeals. Submit any appeal by letter to the Construction Engineer of the Construction Bureau through the District Engineer within 30 calendar days of receipt of the decision. The District Engineer's decision is final if not appealed within 30 calendar days. If

appealed, the District Engineer will forward the original claim, supporting documents or evidence, and the District's evaluation to the Construction Engineer.

The Board of Contract Appeals consists of the Chief Engineer, the Operations Engineer and the Chief Counsel, with the Construction Engineer as Secretary to the Board.

The Board of Contract Appeals will review only those documents and evidence submitted in the original claim, its supporting documents, and the District's evaluation, but may request further information from the District Engineer or Contractor.

The Board may affirm, overrule, or modify, in whole or in part, the decision of the District Engineer. The decision of the Board of Contract Appeals is a final decision.

**105.17 PARTNERING.** Partnering is the formation of a partnership between the Contractor, its principal subcontractors and suppliers, and the Department. Partnerships draw on the strengths of each organization to identify and achieve mutual goals. The objectives are effective and efficient contract performance and completion of all work within budget, on schedule, and meeting the contract requirements.

Partnerships are bilateral in makeup and participation is voluntary. The costs of the partnership are mutually agreed to and shared equally. Partnerships are not a contract requirement and the cost is not to be included in the Contractor's bid. Notify the District Engineer of the intent to partner the project before the Notice to Proceed Date and the Pre-Construction Conference. The Contractor's management personnel and the District Engineer are to organize a Partnering-Team Building Workshop as follows:

- A. **Facilitator.** Select a third party facilitator, with the District Engineer's concurrence, to conduct the workshop.
- B. **Attendees.** Required to attend are the District Engineer, District Construction Engineer, Project Manager, and key project personnel; the Contractor's Project Superintendent and key supervisory personnel, its principal subcontractors and suppliers. Invitations should be made to project design personnel, key specialty or technical personnel, utility management personnel, FHWA, key local or state agency personnel who could impact the project. The Contractor or Department may have other high level managers attend.

One purpose of Partnering is to avoid disputes and the intervention of attorneys. Attorneys and their paralegals will not be invited to attend workshops.

- C. **Agenda.** The workshop agenda consists of the following as a minimum:
  - 1. Discussion of partnering principles;
  - 2. Development of a project charter with defined goals and objectives;
  - 3. Defined problem solving procedure and evaluation process.

Approximately one third of the workshop is to be devoted to team building and problem solving techniques; with the balance devoted to defining project goals, objectives and issue resolution.

- D. **Duration.** The workshop should typically run one and half days, but may be adjusted based on project cost, complexity, number of stakeholder's, partnering experience of attendees, and number of potential issues.

- E. Location.** The workshop location is to be at a neutral location, in Montana, as near the project site as possible.
- F. Payment.** The Contractor is to pay for the facilitator's billed cost and the facility. The Department will pay one-half the costs by Change Order.
  - Follow-up workshops may be held during the project duration as mutually agreed to.
  - The Partnership Charter does not change any legal relationship of the parties to the Contract nor does it relieve either party of any terms of the Contract.